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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/714,119      | 11/14/2003  | Yasuaki Yuda         | MAT-8485US          | 2712             |

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P O BOX 980  
VALLEY FORGE, PA 19482-0980

EXAMINER

NGUYEN, DUC M

ART UNIT PAPER NUMBER

2618

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |              |  |
|------------------------------|-----------------|--------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s) |  |
|                              | 10/714,119      | YUDA ET AL.  |  |
|                              | Examiner        | Art Unit     |  |
|                              | Duc M. Nguyen   | 2685         |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-24 is/are allowed.
- 6) ☒ Claim(s) 25 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                                    |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The references listed in the information disclosure statements submitted on 11/14/03 and 3/29/04 have been considered by the examiner (see attached PTO-1449).

### ***Claim Objections***

2. Claim 25 is objected to because of the following informalities:  
  
“a calibration branches” should be changed to “a calibration branch” in line 7 of the claim.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:  
  
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claims 25-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As to claim 25, the claim recites the limitation “means for combining channel estimation values of both the reception branches and the calibration branch in RAKE

composition by using a channel estimation value of the reception branch, a result of which is used to correct for an amplitude/phase deviation between the reception branches". There are several issues regarding the above limitation,

a- the limitation "by using a channel estimation value of the reception branch" make it unclear how many reception branches are inputted to the RAKE composition (i.e, one of them or all of them) for combining with the calibration branch.

b- it has been known that the RAKE composition produces a **single** output from a plurality of inputs. However, Fig. 2 of the specification shows **two** output results of the RAKE composition to the correction-value detecting unit 110 to detect amplitude/phase deviations. Therefore, it is not clear how many outputs are produced from the RAKE composition (one or two), or in another word, how many outputs are included on "a result" as recited in the claim. If one output, how is it computed or described in the specification ? If two outputs, are they have the same inputs or different inputs? And how are they computed or described in the specification? Also note that no multi-paths is claimed for the RAKE composition.

c- it is noted that there is no existing standard definition regarding the performance function of the RAKE composition (i.e, the output result of the RAKE composition could be a summation of input values, or it could be a maximum value of the plurality of input values, or it could be something else similar to the diversity composition). However, the specification fails to define this RAKE composition. Therefore, it is not clear which function would be performed by the RAKE composition.

For foregoing reasons, the claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –  
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims **25-26** are rejected under 35 U.S.C. 102(a) as being anticipated by **Takakusaki** ("Background Calibration Method for Array Antenna and its Performance", Technical report of IEICE, cited in the IDS).

Regarding claim **25**, **Takakusaki** discloses A radio communication apparatus having an array antenna made up by a plurality of antenna elements and an inter-array signal compositing unit for compositing signals received at the antenna elements, the radio communication apparatus comprising:

reception branches (see Fig. 2-4);

a calibration branch provided separately from the reception branches (see Fig. 2-4); and

means for combining channel estimation values of both the reception branches and the calibration branch in RAKE composition by using a channel estimation value of the reception branch, a result of which is used to correct for an amplitude/phase

deviation between the reception branches (see CAL operation in Fig. 2-4 and section 3-1 on page 7), wherein with the broadest reasonable interpretation, the "CAL operation" block would read on the "RAKE composition" as claimed because the specification fails to define this RAKE composition.

Regarding claim **26**, the claim is rejected for the same reason as set forth in claim 25 above. In addition, **Takakusaki** discloses the reception branches are configured by a plurality of reception branches to convey signals received at the plurality of antenna elements, the calibration branch being configured by selecting one of the reception branches (see Fig. 2-4 noting for the coupler switch).

***Allowable Subject Matter***

7. Claims 1-24 are allowed.
8. The following is a statement of reasons for the indication of allowable subject matter:

As to claim 1, the cited prior art fails to disclose a non-obvious feature improvement for calibrating an antenna array which comprises components as specified in the claim. The non-obvious feature comprises a power detecting unit for detecting a power from an estimating unit and an operating unit for detecting an amplitude ratio and phase rotation amount from outputs of the first and second channel estimating units.

As to claim 12, the cited prior art fails to disclose a non-obvious feature improvement for calibrating an antenna array which comprises components as specified in the claim. The non-obvious feature comprises a first operating unit for multiplying a

conjugate complex number of the channel estimation value on a same path outputted from the channel estimating unit; and a second operating unit for multiplying a conjugate complex number of the channel estimation value for a reception branch on a same path as one taken a correlation with a known signal conveyed through the second radio circuit section;

As to claim 14, the non-obvious feature comprises the same feature as mentioned in claim 1 above, and in addition to the multi-paths limitation as specified in the claim.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US006762717B2 to Hirabe  
US006448939B2 to Maruta  
US006320899B1 to Chang  
US006191736B1 to Yukitomo  
US005530449A to Wachs  
US006708020B1 to Hiramatsu  
US 20030236107A1 to Azuma  
US006115406A to Mesecher  
US006466166B2 to Nakagawa  
US006064338A to Kobayakawa  
US006333934B1 to Miura.

Art Unit: 2685

10. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

(571) 273-8300 (for **formal** communications intended for entry)

(571)-273-7893 (for informal or **draft** communications).

Hand-delivered responses should be brought to Customer Service Window,  
Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner  
should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893,  
Monday-Thursday (9:00 AM - 5:00 PM).

Or to Matthew Anderson (Supervisor) whose telephone number is (571) 272-  
4177.

Duc M. Nguyen, P.E.

Mar 18, 2006

